

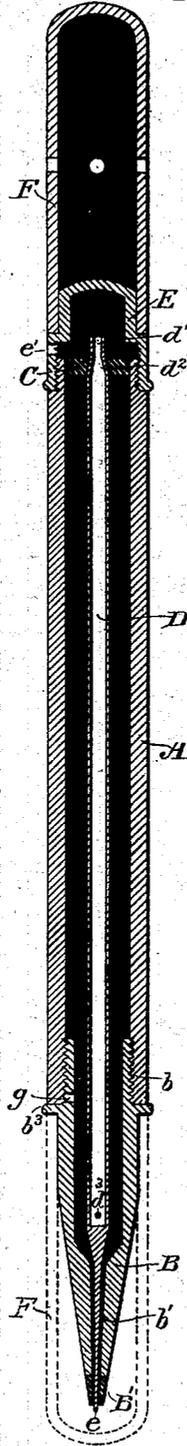
(No Model.)

M. H. KERNER & C. L. DOWNES.

STYLOGRAPHIC FOUNTAIN PEN.

No. 276,425.

Patented Apr. 24, 1883.



WITNESSES

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UNITED STATES PATENT OFFICE.

MARION H. KERNER, OF NEW YORK, N. Y., AND CHARLES L. DOWNES, OF JERSEY CITY, N. J.; SAID DOWNES ASSIGNOR TO SAID KERNER.

STYLOGRAPHIC FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 276,425, dated April 24, 1883.

Application filed July 11, 1882. (No model.)

To all whom it may concern:

Be it known that we, MARION H. KERNER, of New York, in the county and State of New York, and CHARLES L. DOWNES, of Jersey City, in the county of Hudson and State of New Jersey, citizens of the United States, have jointly invented certain new and useful Improvements in Stylographic Fountain-Pens, of which the following is a specification.

Our invention relates especially to that class of stylographic pens which contain an air-tight ink-reservoir and a marking-point centrally perforated with an ink-duct, in combination with a needle or spindle loosely supported within the ink-duct and normally projecting somewhat beyond the marking-point, to which is imparted, by the ordinary motion employed in writing, a sufficient longitudinal movement to and fro to cause the ink to flow through the duct to the writing-point.

It has hitherto been usual to support the longitudinally-moving needle within the writing-point by means of a spiral spring or other equivalent device applied to the lower extremity of a tubular air-chamber, which extends through the ink-reservoir to the upper extremity of the handle, or by such spring applied directly to the barrel or handle of the pen. This method of supporting the needle renders the apparatus somewhat complicated in construction, while the chemical action of the ink soon destroys the thin wire spring or other elastic material which supports the needle, and thus renders the pen useless.

The object of our invention is to improve the construction of fountain-pens of this character, and by removing the above defects to render them less liable to become disarranged or inoperative by reason of continued use.

Our invention consists in attaching the longitudinally-moving needle rigidly to the tubular air-duct, and in supporting the latter within the hollow handle or barrel of the pen by means of an elastic or yielding washer or diaphragm applied to the upper extremity of the tubular handle, whereby it serves both to close the ink-reservoir and to permit the necessary longitudinal movement to and fro of the air-tube and needle.

The accompanying drawing is a longitudinal

section of a stylographic fountain-pen embodying our improvements.

Referring to this drawing, A represents the handle or barrel of the pen, which is preferably tubular in form, and may be constructed of hard rubber, metal, or other suitable material.

B is a conical point-section or marking-point, which screws into the lower end of the handle A, as shown at *b*, and is preferably tipped with iridium or other suitable hard metal at its point B'. The marking-point B is centrally perforated with an ink-duct, *b'*, of conical or tapering form narrowing toward its lower extremity, as shown in the drawing. The handle A is closed at its upper end by a diaphragm, C, of soft rubber or other suitable elastic material, which serves also to support a tubular air-duct, D, extending longitudinally through the handle and terminating within the point-section B. The upper extremity, *d'*, of the air-tube D, extends through and fits tightly within a corresponding perforation formed in the center of the diaphragm C, and is provided with a shoulder, *d²*, which prevents it from being pushed too far through the diaphragm. A needle or spindle, *e*, or iridium or other suitable metal, is secured to the lower end of the air-duct D, and is rigidly attached thereto by soldering or otherwise. The needle *e* fits loosely within the ink-duct *b'*, and normally projects a short distance below the tip of the marking-point B. The lower end of the air-duct D is perforated with an aperture, *d³*, which allows the air to enter the ink-reservoir which surrounds the air-duct to displace the ink employed in writing.

A hollow cylindrical cap, E, is screwed upon the upper extremity of the barrel A, thus forming an air-chamber into which the air-duct opens. The cap E is preferably perforated with one or more holes, *e'*, which serve to permit the free access of air at all times into the air-chamber and the tube D. In some instances, however, it may be desirable to place the opening *e'* at a lower point upon the cap E for the purpose of closing the air-chamber when the pen is not in use. In such case the air-chamber may be opened, when required, by unscrewing the cap until the perforation is brought above the upper extremity of the barrel A. A

similar perforation is provided in the point-section B, as shown at *g*, for the purpose of allowing the escape of the air from the ink-reservoir while the point-section is being attached after the ink-reservoir has been refilled. This perforation is placed at such a distance from the burr *b*³ upon the point-section that it will be covered by the handle A just before the point-section reaches its bearing when it is screwed into the handle. The escape of the ink into the air-tube D and through the ink-duct *b'*, which would otherwise be occasioned by the compression of the air in applying the point-section, is by this means prevented.

A cap, F, fitting over the point B, as shown in the dotted lines, is provided for protecting the needle and writing-point when the pen is not in use. This cap is preferably so constructed that it may be placed upon the upper extremity of the cap F after having been removed from the point-section, as shown in full lines in the drawing.

The operation of our improved pen is in most respects similar to that of the ordinary stylographic pen. When the point is pressed upon the paper the needle *e*, together with the air-tube E, is forced upward against the yielding diaphragm D, which, by its resilience, pushes it down again when the point is removed from the paper, as at the end of a word. The movement of the point over the surface of the paper in the manner of ordinary writing thus produces a to-and-fro movement of the needle and tube, which is sufficient to cause the ink to descend through the handle and ink-duct, and to be supplied as required to the marking-point.

By rigidly attaching the needle to the air-tube D and supporting the said air-tube from the diaphragm C we are enabled to dispense with the springs which have hitherto been re-

quired at the lower end of the air-tube, and at the same time to greatly simplify the construction and improve the operation of the pen.

It is evident that the particular form of the diaphragm C and the mode which we have shown of attaching the air-tube D thereto may be varied as found desirable. The essential feature of the invention consists in the manner of supporting the tube, together with the point, from a point at the upper extremity of the tube. Hence the longitudinal movements of the tube act not only to supply the ink to the marking-point, but to agitate the whole body of ink contained in the reservoir.

We claim as our invention—

1. The combination, substantially as hereinbefore set forth, of the tubular handle, the air-duct, the yielding elastic diaphragm at the upper extremity of said air-duct, and the needle rigidly attached to the lower extremity thereof.

2. The combination, substantially as hereinbefore set forth, of the tubular handle, the longitudinally-movable air-duct, the elastic support at the upper extremity of said duct, the cap affixed to said handle, the air-chamber formed by said cap above the upper extremity of said air-duct, and the aperture through said cap.

3. The combination, substantially as hereinbefore set forth, of the longitudinally-vibrating air-duct, the needle for vibrating the same, and the tubular inclosing case or handle.

In testimony whereof we have hereunto subscribed our names this 8th day of July, A. D. 1882.

M. H. KERNER.
CHAS. L. DOWNES.

Witnesses:

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CHARLES A. TERRY.